OCEAN DISCOVERY INSTITUTE
EVALUATION REPORT
September 2022 – August 2023

About Ocean Discovery Institute

To inspire the next generation of science leaders, Ocean Discovery Institute creates learning experiences for young people traditionally excluded from science due to race, income status, and educational opportunity. Our students will join high-paying fields, break generational poverty, and change the future of science.

Our Evaluation Approach

Evaluation is a significant component of our educational model. Evaluation of our programs and our students provides critical data that guides us in determining progress towards our goals, informs subsequent enhancements to our programs, and keeps our efforts aligned with our mission.

Our Educational Programs and Goals

Our educational programs are structured with a "pyramid" approach (Fig. 1). Our pyramid design demonstrates the number of students reached by a program, with an inverse relationship between the number of students reached and the intensity and impacts generated through participation.

Figure 1. The pyramid approach to our educational programs, showing the number of students served by each program when our programs have reached full capacity, student goals by program, and the scale of impacts generated through participation.

We provide our programs through three distinct, and progressively rigorous, educational programs (Fig. 1):

- In-School Programs serve entire classes of K-12 students during the school day with hands-on science activities and field trips.
- Out-of-School Programs serve K-8 students who sign up to come to the Living Lab after school and in summer to participate in science camps.
- Leadership Programs serve students beginning in 8th grade through a rigorous pathway program to prepare students to go to college and become science leaders.

This educational model drives our evaluation goals, which are as follows for each program:

- Our In-School Programs will break down barriers of perception toward science, build community ownership of a place of science, and nurture our students to BELIEVE that science is something they can do and a scientist is someone they can be.
- Our Out-of-School Programs will build upon our In-School Programs by additionally supporting our students to ACHIEVE improved understanding of scientific concepts and the scientific process, as well as achievement of positive academic performance in school.
- Our Leadership Programs will build upon the science belief and achievement fostered in our In- and Out-of-School Programs and empowers our students to LEAD by taking the necessary steps to pursue and obtain careers in science or science-related fields, by taking opportunities to use science to make a difference, and by participating as science leaders and mentors.

OUR EVALUATION METHODS

We combine both qualitative and quantitative evaluation methods for all programs:

- *Qualitative:*
  - Observations of program alignment with our Education Foundation (the guiding document of our educational philosophies and design principles)
  - Observations of instructor alignment with our Educator Principles (the guiding document for instructors' pedagogical approach across all programs)
  - Collection of stakeholder feedback (Teacher and Family)
- *Quantitative:*
  - We use a variety of assessment methods to assess student outcomes, including research-informed surveys, quantitative assessments, comparisons of academic data, and college matriculation and graduation data. We implement these methods during programs, then analyze the data and communicate outcomes via a variety of internal and external channels.

HIGHLIGHTED EVALUATION RESULTS: 2022-23 ACADEMIC YEAR (SEPTEMBER 2022 THROUGH AUGUST 2023)

Quantitative: Numbers Served

Introduction & Methods

- Our "pyramid" program model is described above and shown in Fig. 1.
- Student attendance is recorded at each program session and entered into our program database.

Results

In-School Programs

IS Grade	Original Projection	Actual Attendance	Cluster Enrollment	% of Grade Served
Kinder	800	609	976	62%
1st	725	645	771	84%
2nd	700	591	723	82%
3rd	675	658	728	90%
4th	675	666	740	90%
5th	700	683	754	91%
6th	575	469	631	74%
7th	525	473	574	82%
8th	525	434	569	76%
9th	400	342	747	46%
10th	0	26	751	3%
11th	0	17	553	3%
12th	0	9	600	2%
Total	**6300**	**5622**	**9117**	**62%**

K-8 Subtotal	IS Attendance	Cluster Enrollment	% Served
K-8	5228	6466	81%

Table 1. Top: Number of students served by In-School Programs, including the original projection of numbers served, the actual student attendance, the number of students enrolled in that grade level in our Cluster, and the percentage of that grade level served. Bottom: Number of students served only in grades Kinder-8.

Out-of-School Programs

OS Program	# Served
After-School Camp	591
Summer Camp	300
Total	**891**

Table 2. Top: Number of students served in the two Out-of-School Programs (After-School Camp and Summer Camp).

Leadership Programs

LP Program	# Served
OL Coaching & Community Building	65
OL Bridge	19 + 7 HS mentors
OL Intro to Research	14
OL Alumni	120
Total High School Students	**84**
Total High School + Alumni	**204**

Table 3. Number of students served in Leadership Programs.

All Programs Numbers Served

Program	# Served
In-School	5,622
Out-of-School	891
Leadership	204
Total – Includes Duplicates	6,717
Total – No Duplicates	5,826

Table 4. Number of students served in all programs. The number including duplicates shows students who participated in both In-School and Out-of-School programs. The number not including duplicates shows the number of unique students served.

Hours of Programming

Program	# Served	Average Hours Per Student			Total Program Hours	Total Student Hours
In-School	5,622	7.5			1,574	44,976
Out-of-School	891	*After-School*	*Summer*	*Total*	735	18,792
		12	39	21		
Leadership	204	*High School*	*Alumni*	*Total*	669	4,850
		53	3	24		
Total	**5,821**	**12**			**2,375**	**68,618**

Table 5. Number of hours of programming provided for students, including average hours per student, the number of total hours provided by each program, and the total student hours.

Ethnicity	Percentage of Students Served
Black / African American	8.1%
American Indian / Alaska Native	0.3%
Asian	10.1%
Pacific Islander / Native Hawaiian	0.2%
Caucasian	3.9%
Hispanic / Latino	67.3%
Multi-racial / Other	10.1%

Table 7. Ethnic breakdown of students served.

Discussion

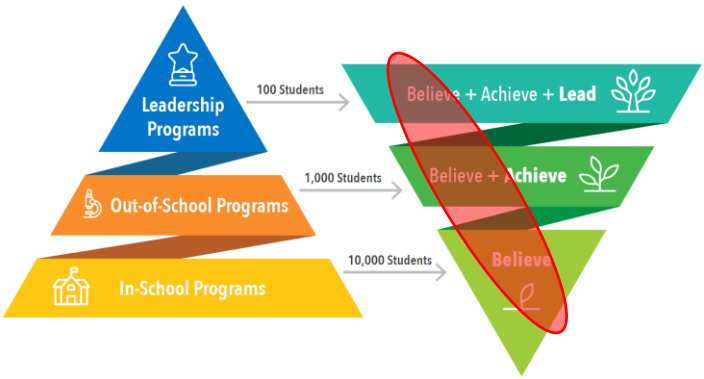
- **Communication Points: During the 2022-23 school year, 5,826 students from a low-income community of color participated in tuition-free science programming.**
- Students ranged from Kinder through 12th grade. Participants also included college-aged and older program alumni.
- This was the first year in Ocean Discovery's history that high school students were served by In-School Programs, primarily at the 9th grade level. We will continue to expand the In-School Program in the coming years to serve all high school grades, 10-12.
- For the In-School programs, the final attendance of 5,622 students was 678 fewer students than we had projected (6,300). After analyzing our attendance data and discussing trends, we have identified a few factors contributing to this gap:
    - The primary reason was that overall enrollment in our school-shed declined from the previous school year. We had made our projections based on the previous year's enrollment.
    - Our projections assumed an 85% attendance rate, which was based on attendance during the previous school year (2021-22). Our 3rd, 4th, and 5th grade programs all exceeded this rate, at 94% attendance. Other grades fell short, including:
        - Kinder: we suspect that this may actually be an enrollment issue, rather than attendance, as we know that Kinder enrollment in our schools fluctuates more than any grade. We had projected to serve 800 Kinder students, and actually served 609. We know that enrollment at our schools declines from the beginning of the school year to the end, and Kinder is the last grade we serve during the school year. It appears that Kinder enrollment declined to 629 students by the end of the school year.
        - 6th Grade: similar to Kinder, we serve 6th grade students at the end of the school year, when enrollment has declined significantly.
        - Middle school grades: middle school students are more likely than elementary school students to not attend field trips, either due to disciplinary reasons, or because of missing permission slips.
        - All grades: across all grades and at all schools, students are enrolled in special education classes, and their participation in our programs varies due to multiple factors. Some special education classes participate in our In-School Programs through involvement in

the inclusive learning model at their school. Other classes do not participate, based on teacher discretion.

- The overarching takeaway is that we are still learning how to follow the trends in school enrollment. We only gained the ability to track detailed student attendance in programs two years ago, and the previous school year's numbers were still impacted by the COVID-19 pandemic. We will use what we have learned from this year's attendance and enrollment data to adjust our projections for future years of programming.

Quantitative: Student Belief

Introduction



For individuals in our community and beyond, substantial inequities exist along the pipeline from birth to science and science-related careers. Belief provides the motivation to persist in the face of these barriers. It manifests itself in positive academic behaviors and performance, and, in turn, fuels students' perseverance along their educational and career pathway. Our programs are designed to address the many opportunity gaps in the educational pathway experienced by our community and build in students, first, a belief that science is something they can do and scientist is someone they can become. Furthermore, we maintain an unshakeable belief in our students' potential, and in turn they believe in themselves.

Across all programs, the functional goal is that 70% of students demonstrate a positive sense of self-belief in science.

Methods

In-School Programs:

- Within our In-School Programs, the self-evaluation Believe Survey is implemented once per student per grade level starting in 3rd grade. Each student attending our In-School Program completes a Believe Survey once in each grade level, and specifically during the lesson that takes place at the Living Lab (typically the third and last day of a given curriculum).

Out-of-School Programs:

- Within our Out-of-School Programs, the self-evaluation Believe Survey is implemented once per student for students in 3rd grade and older. Each student attending our After-School Camp and/or Summer Camp completes a Believe Survey once per program, and specifically on the fifth and final day of camp.

- In 2022-23, the Believe Survey was not administered during the period of Fall 2022. It was administered beginning in January 2023.

Leadership Programs:

- Within our Leadership Programs, the self-evaluation Believe Survey is implemented once per student. Each student participating in an intensive summer program completes a Believe Survey once per program, and specifically on the twelfth and final day of the program.

All Programs:

- The survey is implemented by program staff according to the Believe Survey Administration Protocol.
- Each student's Likert-type responses to the ten Believe statements are entered into the Believe survey database, along with relevant categorical information (e.g., student name, grade level, school). In the database, the Likert-type responses are coded such that 5 represents the most positive response and 1 the least positive response for a given statement.
- The analyses for our In-School Programs take two approaches: 1) assessing the extent to which each grade level has positive responses regarding each BELIEVE goal, and 2) assessing whether the impacts of our programming, which are believed to be additive, are demonstrated through having equally large or larger positive responses for eighth graders compared to their younger peers.

Results

In-School Programs

	Total	I Believe I Can Have A Career In Science		I Believe I Can Do Science		I Believe Science Is Important		I Believe I Can Recognize Science		I Believe I Can Use Science To Make A Difference	
Grade	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)
3	63%	3.5	55%	3.5	59%	3.8	67%	3.6	58%	3.9	70%
4	60%	3.4	50%	3.5	56%	3.7	64%	3.5	55%	4.0	72%
5	60%	3.4	47%	3.5	54%	4.1	66%	3.5	52%	4.2	73%
6	47%	3.0	38%	3.2	45%	3.5	50%	3.4	43%	3.7	54%
7	51%	3.1	37%	3.2	50%	3.4	51%	3.4	47%	3.7	66%
8	49%	3.1	32%	3.3	47%	3.5	52%	3.5	53%	3.9	62%
9	53%	3.3	46%	3.3	51%	3.5	54%	3.4	53%	3.6	63%
10	NA										
11	NA										
12	NA										
3-5 Total	**61%**	**3.4**	**51%**	**3.5**	**56%**	**3.9**	**66%**	**3.5**	**55%**	**4.0**	**72%**
6-8 Total	**49%**	**3.1**	**36%**	**3.2**	**47%**	**3.5**	**51%**	**3.4**	**48%**	**3.8**	**60%**
9-12 Total	**53%**	**3.3**	**46%**	**3.3**	**51%**	**3.5**	**54%**	**3.4**	**53%**	**3.6**	**63%**
3-12 Total	**55%**	**3.2**	**44%**	**3.3**	**51%**	**3.6**	**58%**	**3.4**	**52%**	**3.9**	**66%**

Table 8. Results of the Believe Survey for In-School Programs. For each grade level, the % of survey responses that were "positive" (a 4 or 5 on a scale of 1-5) is shown. The same % and average response for each of the five Believe goals is also shown.

Out-of-School Programs

	Total	I Believe I Can Have A Career In Science		I Believe I Can Do Science		I Believe Science Is Important		I Believe I Can Recognize Science		I Believe I Can Use Science To Make A Difference	
Program	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)
After-School Camp	86%	4.3	100%	4.4	94%	4.7	67%	3.7	63%	4.9	106%
Summer Camp	65%	3.7	57%	3.7	60%	4.0	66%	3.8	60%	4.2	76%
OS Annual Total	**75%**	**4.0**	**79%**	**4.0**	**77%**	**4.3**	**66%**	**3.7**	**61%**	**4.6**	**91%**

Table 9. Results of the Believe Survey for Out-of-School Programs. For each program, the % of survey responses that were "positive" (a 4 or 5 on a scale of 1-5) is shown. The same % and average response for each of the five Believe goals is also shown.

Leadership Programs

	Total	I Believe I Can Have A Career In Science		I Believe I Can Do Science		I Believe Science Is Important		I Believe I Can Recognize Science		I Believe I Can Use Science To Make A Difference	
Program	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)	Avg. Response (1-5)	% of Responses Positive (>3 of 5)
OL Bridge	79%	4.2	85%	3.9	74%	4.1	82%	3.7	59%	4.4	82%
OL Intro To Research	92%	4.0	81%	4.0	92%	4.3	95%	4.1	85%	4.5	100%
LP Total	**85%**	**4.1**	**83%**	**4.0**	**83%**	**4.2**	**89%**	**3.9**	**72%**	**4.5**	**91%**

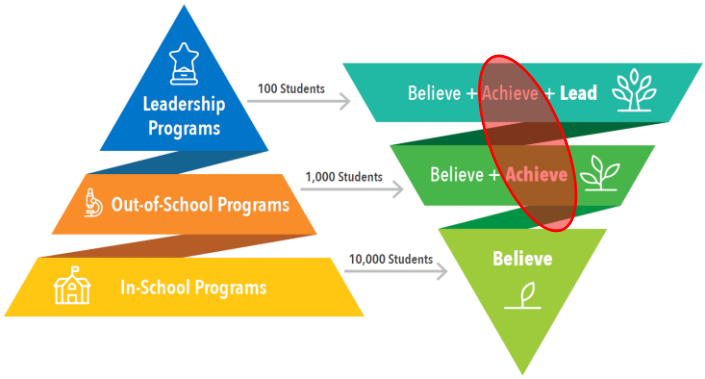
Table 10. Results of the Believe Survey for Leadership Programs. For each program, the % of survey responses that were "positive" (a 4 or 5 on a scale of 1-5) is shown. The same % and average response for each of the five Believe goals is also shown.

Discussion

- **Communication Points: Although less than 1% of their peers nationwide with similar socioeconomic demographics are working in science-related careers, 55% of students in the In-School Program showed "positive science belief" on the Believe Survey in the 2022-2023 school year.**
- We saw a total percentage of positive responses of 55% for In-School Programs, 75% for Out-of-School Programs, and 85% for Leadership Programs. These percentages follow the same trend of increasing programmatic impacts as described in our "pyramid approach" (Figure 1).
- For In-School Programs, the overall positive Belief percentage (55%) was lower than in the previous school year (61%). It was also lower than the functional goal of 70%. We may want to revisit A) the factors that led to setting the functional goal at 70% and potentially revising; and B) the content and delivery of the program to determine if there are areas that could be enhanced to increase student Belief.
- We have edited the Believe Survey for the 2023-24 school year. Changes include:
    - Two additional questions related to building a growth mindset were added.
    - Questions were edited to better align with the five existing Believe goals.
- In 2023-24, as surveys are not recommended for children under the age of eight (Borgers et al. 2000; De Leeuw, 2011), we are piloting the use of a modified Believe Survey to administer for younger students (Grades 1 and 2). These surveys use simplified language and allow students to link their feelings to science to different emojis.

Quantitative: Achievement

Introduction



Our goal in Out-of-School and Leadership Programs is that students achieve in science through improved understanding of scientific concepts and the scientific process as well as achievement of positive academic performance in school.

Consistent academic achievement in grades K-12 is a key determinant in a young person's ability to attend college, receive a science or science-related degree, and obtain careers in science and related fields. However, science test scores of students of color and from low socio-economic status communities lag far behind those of Caucasian students and students from more affluent areas (Irwin et al., 2022). In 2018, 86% of the 11th graders at Hoover High School (the high school served by Ocean Discovery) did not meet state math test standards. Furthermore, learning loss related to the COVID-19 pandemic has been widely documented (NAEP 2023); for 4th graders, average reading and math scores in 2022 declined 5 points in reading and 7 points in mathematics compared to 2020. This is the largest average score decline in reading since 1990. Decreases were greatest amongst students historically furthest from opportunity. In mathematics, Black students' 13-point score decrease, along with White students' 5-point decrease, resulted in a widening of the score gap from 25 points in 2020 to 33 points in 2022. In 2022, Hispanic students in the 25th percentile (lower performance levels) experienced a 9-point reading decrease and a 12-point decrease in math.

Methods

Report Card Grades and GPA:

Through our data sharing agreement with San Diego Unified School District, we are provided with grade level-specific academic data on a semester basis for all students in Kindergarten through 12th grade in the school-shed. These data include the following:

- **Kindergarten through Grade 5**: Individual course grades
- **Grades 6 through 8**: Individual course grades, cumulative GPA
- **Grades 9 through 12**: Individual course grades, weighted cumulative GPA

Report card grades and GPA are analyzed twice per year: at the end of the first grading period for a particular grade level (note that middle schools are on a different grading schedule than elementary and high schools), and at the end of the academic year.

Analysis includes the following:

- Control Group: average report card grades and GPAs are calculated for all students in the school-shed who did not participate in Out-of-School or Leadership Programs.

- Experimental Group: average report card grades and GPAs are calculated for students who participated in Out-of-School or Leadership Programs.

Standardized Test Scores

SDUSD annually administers two grade-specific standardized tests. The California Science Test (CAST) is a standardized test based on Next Generation Science Standards (NGSS) and is administered in grades 5, 8, and once in high school in either grade 10 or 11. The California Assessment of Student Performance and Progress (CAASPP) includes a Smarter Balanced Summative Assessment (SBA) for Mathematics and is administered in Grades 3 through 8, and in Grade 11. Data for the school-shed are summarized in reports generated by SDUSD by achievement level ("Standard Not Met", "Standard Nearly Met", "Standard Met", "Standard Exceeded") and represent the number and percentage of students that were classified in each of these achievement levels based on the accuracy of their responses on each of the standards-based tests.

We track and summarize, as applicable, the annual results of the standardized test scores for the school-shed using the reports prepared by SDUSD. We also collect the same standardized test score data from a control group of schools within SDUSD that are not in our school-shed. This control group was determined using publicly-available data from the California Department of Education; we selected the group of non-school-shed schools within SDUSD that had the most similar socioeconomic (income and ethnicity) demographics to our school-shed.

We analyzed the most recent available standardized test score data, which was from the 2021-22 school year.

Results

Out-of-School Programs

Report Card Grades: Grades K-5

Grading Period	OS Math Grade	Control Math Grade	OS Science Grade	Control Science Grade	OS English Grade	Control English Grade
1	2.08	2.19	2.55	2.44	2.09	2.06
4	2.48	2.42	2.70	2.65	2.40	2.31

Table 11. Average report card grades for the Out-of-School Program's participating elementary school students compared to the control group. Grades are calculated on 1-4 scale, with 1 representing "Beginning progress towards grade level expectations" and 4 representing "Exceeding grade level expectation".

Report Card Grades: Grades 6-8

Grading Period	OS Math Grade	Control Math Grade	OS Science Grade	Control Science Grade	OS English Grade	Control English Grade
2	3.58 / C+	3.30 / C	3.58 / C+	3.43 / C	3.44 / C	3.10 / C
4	3.26 / C	2.99 / C	3.58 / C+	3.32 / C	3.24 / C	3.07 / C

Table 12. Average report card grades for the Out-of-School Program's participating middle school students compared to the control group. Grades are calculated on a traditional A-F level, and converted here where A=5, B=4, C=3, D=2, and F=1. An approximate letter grade is included next to each average grade.

GPA

Grading Period	OS GPA	Control GPA	p-value
1	2.89	2.52	0.01 (significant)
4	2.78	2.51	0.025 (significant)

Table 13. Average GPAs for the Out-of-School Program's participating middle school students compared to the control group. GPA is calculated on a 0-4 scale. The p-value from a T-Test is included to show statistical significance.

Leadership Programs

Report Card Grades

Grading Period	OL Math Grade	Control Math Grade	OL Science Grade	Control Science Grade	OL English Grade	Control English Grade
1	3.36 / C	3.18 / C	3.60 / C+	3.49 / C	4.16 / B	3.30 / C
4	3.52 / C+	3.02 / C	4.0 / B	3.39 / C	3.86 / B-	3.27 / C

Table 14. Average report card grades for the Leadership Program's participating high school students compared to the control group. Grades are calculated on a traditional A-F level, and converted here where A=5, B=4, C=3, D=2, and F=1. An approximate letter grade is included next to each average grade.

GPA

Grading Period	Ocean Leader GPA	Control GPA	p-value
1	2.89	2.52	<0.01 (significant)
4	2.79	2.45	<0.01 (significant)

Table 15. Average GPAs for the Out-of-School Program's participating middle school students compared to the control group. GPA is calculated on a 0-4 scale. The p-value from a T-Test is included to show statistical significance.

Standardized Test Scores

In the 2021-22 school year, more students at our participating schools either met or exceeded all standards compared to students at the control schools (Fig. 2). Additionally, fewer students at our participating schools tested in the category of "Standard Not Met" compared to students at the control schools (Fig. 2).

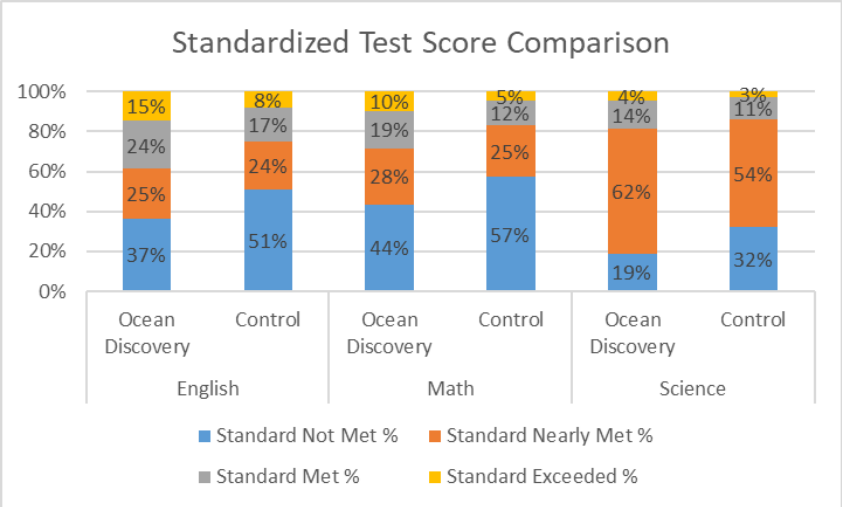


Figure 2. Mean standardized test scores, shown as a percentage of students who either did not meet, nearly met, met, or exceeded the subject standard, in English, math, and science for schools in the Ocean Discovery school-shed and a control group within SDUSD.

In 2021-22, students at our participating schools scored 34% higher on math, science, and English standardized test scores (p=0.04) compared to their peers at non-participating schools with similar socioeconomic demographics (Table 16).

	English		Math		Science	
	Ocean Discovery	Control	Ocean Discovery	Control	Ocean Discovery	Control
Standard Not Met %	37%	51%	44%	57%	19%	32%
Standard Nearly Met %	25%	24%	28%	25%	62%	54%
Standard Met %	24%	17%	19%	12%	14%	11%
Standard Exceeded %	15%	8%	10%	5%	4%	3%
Combined Met/Exceeded	39%	25%	28%	17%	19%	14%
	ODI		**Control**			
Total Met/Exceeded	29%		19%			

Table 16. Mean standardized test scores, shown as a percentage of students who either did not meet, nearly met, met, or exceeded the subject standard, in English, math, and science for schools in the Ocean Discovery school-shed and a control group within SDUSD. The total mean percentage of students who either met or exceeded all subject standards is listed at bottom.

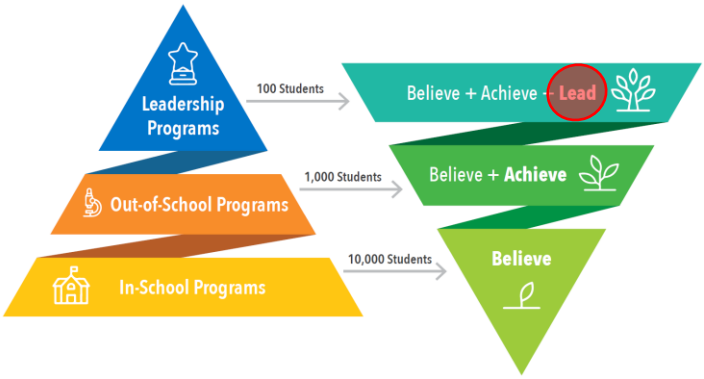
Discussion

- **Communication Points:**
  - **The average science and English report card grades for elementary school students participating in our Out-of-School programs was higher than their peers at school who did not participate in the program.**
  - **The average math, science, and English report card grades for middle school students participating in our Out-of-School programs was higher than their peers at school who did not participate in the program.**
  - **The average GPA for middle school students participating in our Out-of-School programs (2.78) was higher than their peers at school who did not participate in the program (2.51), a statistically significant difference.**
  - **The average math, science, and English report card grades for the high school "Ocean Leaders" participating in our Leadership Programs was higher than their peers at school who did not participate in the program.**
  - **Our Ocean Leaders averaged a B on their science report cards, compared to a C for their peers at school.**
  - **The average GPA for the high school "Ocean Leaders" participating in our Leadership Programs (2.79) was higher than their peers at school who did not participate in the program (2.45), a statistically significant difference.**
  - **In the Hoover Cluster schools served by our In-School Programs, students scored 34% higher on math, science, and English standardized test scores (p=0.04) compared to their peers at non-participating schools with similar socioeconomic demographics.**
- A continued focus for the 2023-24 school year will be elevating math within programs in order to increase students' sense of math belief and identify, in theory leading to improved math achievement.

Quantitative: Leadership

Introduction

Our Leadership Programs pair rigorous science programming and experiences with college and career support services in order to develop young people into science leaders who make a difference in their community and our world. This program builds upon the other program tiers and uniquely also provides the practice of soft skills and practical tools for college and career.



In order to main our country's position as world leaders in science and innovation, our science workforce needs increased representation from individuals from the socioeconomic backgrounds of our students. However, these students are less likely to pursue the higher education necessary for science- and technology-based careers (Pew Research Center, 2021). As a result, the United States' scientific workforce does not reflect the population of the nation as a whole; for

example, Hispanic individuals represent 18.9% of the U.S. population, but only 8% of jobs in science, technology, engineering, and math fields (Pew Research Center, 2021).

Through our Leadership Programs, we provide a foundation upon which our students are empowered to lead by taking the necessary steps to pursue and obtain a career in science or science-related fields, taking opportunities to use science to make a difference, and participating as science leaders and mentors.

Methods

The progress of our Ocean Leaders, from initial participation in our programming through college and career, is tracked so that we can provide targeted supports to our students as well as share their successes with the community, our partners, and beyond. Tracking data such as high school graduation date, college attendance and graduation data, major, and career progression are maintained in our program management database. Additionally, we alumni participation in all Ocean Discovery programs and volunteer activities. These data allow us to determine the extent of the impacts our programming is having on our students now and into the future.

Our post-high school tracking data are obtained through three primary sources: program and volunteer attendance data, annual Ocean Leader alumni surveys, and National Student Clearinghouse data. Alumni surveys are emailed to all alumni and request updates on their career progression with particular emphasis on science-related milestones. National Student Clearinghouse (NSC) data for Hoover High School graduates are obtained via subscription to the NSC service, and allow us to track all graduates' college entry and progression, including for our Ocean Leaders. The NSC data also allow us to calculate baseline metrics for college matriculation and graduation, and science/related major completion for Hoover High School graduates, providing data for a comparison group as well as for our Ocean Leaders.

Results

Ocean Leader Enrollment in Higher Education (2023)

Graduating Class	# of Graduates	% Enrolling in Higher Education	% Enrolling in a 2-Year Institution	% Enrolling in a 4-Year Institution	% Not Enrolling in Higher Education
2023	11	100%	45%	55%	0%

Table 17. Enrollment in higher education by graduating 12th grade Ocean Leaders, including in 2-year and 4-year institutions.

Hoover High School Enrollment in Higher Education

Graduating Class	# of Graduates	% Enrolling in Higher Education	% Enrolling in a 2-Year Institution	% Enrolling in a 4-Year Institution	% Not Enrolling in Higher Education
2022	440	64%	40%	24%	36%
2023	471	53%	42%	10%	47%

Table 18. Enrollment by graduating 12th grade students from Hoover High School, including in 2-year and 4-year institutions.

Ocean Leader Alumni in College and Career

High School Cohort Year	# Participants in Database	# Currently Enrolled in College	# Currently Pursuing Science & Related Degree	# Eligible to Graduate College*	# College Graduates	# Received Science or Related Degree	# Career Field Known	# In Science & Related Careers
2005	3	0	0	3	3	3	1	1
2006	3	0	0	3	3	3	3	3
2007	4	0	0	4	4	2	3	3
2008	7	0	0	7	6	3	6	3
2009	7	0	0	7	6	6	7	6
2010	7	0	0	7	4	3	7	3
2011	9	0	0	9	8	7	9	7
2012	3	0	0	3	3	2	3	3
2013	5	1	1	5	2	2	4	2
2014	2	1	0	2	0	0	1	0
2015	8	1	1	8	5	4	7	5
2016	8	2	1	8	2	1	6	1
2017	3	1	0	3	1	0	1	0
2018	10	3	1	7	2	2	4	1
2019	12	6	4	3	3	3	5	2
2020	15	10	3	0	0	0	2	2
2021	6	3	2	0	0	0	1	0
2022	8	6	2	0	0	0	0	0
2023	11	10	2	0	0	0	0	0
Totals	**131**	**44**	**17**	**82**	**47**	**41**	**70**	**42**
Percentages	-	-	-	-	**59%**	**87%**	**-**	**60%**

*Table 19. College enrollment, college graduation, and career status information for Ocean Leader Alumni by high school cohort year. *Eligible to graduate college is defined as the following: students who either a) graduated high school 6 or more years ago; b) graduated high school between 4-6 years ago and are no longer enrolled in college; or c) graduated high school within the past 6 years and graduated college. The percentage of college graduates is calculated as (# of College Graduates / # Eligible to Graduate College). The percentage in science & related careers is calculated as (# in Science & Related Careers / # Career Field Known).*

Ocean Leader Alumni Volunteering

# of Eligible Alumni*	# of Alumni Volunteering	% of Alumni Volunteering
59	14	24%

*Table 20. Number and percentage of eligible alumni who volunteered with the organization. *Eligible alumni = graduated high school 6 or more years ago.*

Ocean Leader Alumni Donating

# of Eligible Alumni*	# of Alumni Donating	% of Alumni Donating
59	22	37%

*Table 21. Number and percentage of eligible alumni who donated financially to the organization. *Eligible alumni = graduated high school 6 or more years ago.*

Discussion

- **Communication Points:**
  - **100% of graduating 12th grade students enrolled in higher education, compared to 53% of their peers in their high school graduating class.**
  - **59% of Ocean Leader alumni have earned a college degree, compared to 13% of their peers nation-wide from similar socioeconomic backgrounds.**
  - **87% of college graduates majored in a science or science-related field.**
  - **60% of Ocean Leader alumni currently have jobs in science or science-related fields, compared to 1% of their peers nation-wide from similar socioeconomic backgrounds.**
  - **24% of Ocean Leader alumni give back to the organization as volunteers.**
  - **37% of Ocean Leader alumni give back to the organization as donors.**
  - **9 Ocean Leader alumni have received Master's degrees and 2 have received Doctorate degrees.**
- The percentage of Ocean Leader alumni who earn a college degree (59%) is lower than previous data have shown (80%). This is likely due to a newer source of data, from the National Student Clearinghouse, providing more accurate college enrollment data. For example, several students who were previously assumed to still be enrolled in college (and thus not counted as "eligible to graduate", as described in Table 19) are now known to have un-enrolled from college.
- College and career data are fluid, and percentages can increase and decrease annually. Some students who are not currently enrolled in college will re-enroll and eventually graduate.

Qualitative: Alignment With Education Foundation

Introduction

Our Education Foundation guides all of our programming. It provides the foundation upon which we set programmatic goals, design and implement curricula, and evaluate impacts. The Education Foundation outlines the strategies (Design Principles) we use for each of our broad educational initiatives as well as describes what the ideal state of these strategies is when implemented (Design Principle Benchmarks). When our design principles are optimally implemented in our programs, it is hypothesized that our programs will have the maximum positive impact on our students. Education Foundation alignment is, therefore, both a forward-looking and a backward-looking process. We intentionally develop our programs so that they specifically address our design principles (forward-looking), and then periodically evaluate our implemented programs against our design principles (backward-looking) to ensure the programs are meeting the specific criteria described in our Education Foundation. The results of this evaluation drives future enhancements (Fig. 2). This cyclical process ensures that we stay true to our unique educational approach and that our approach is effective.

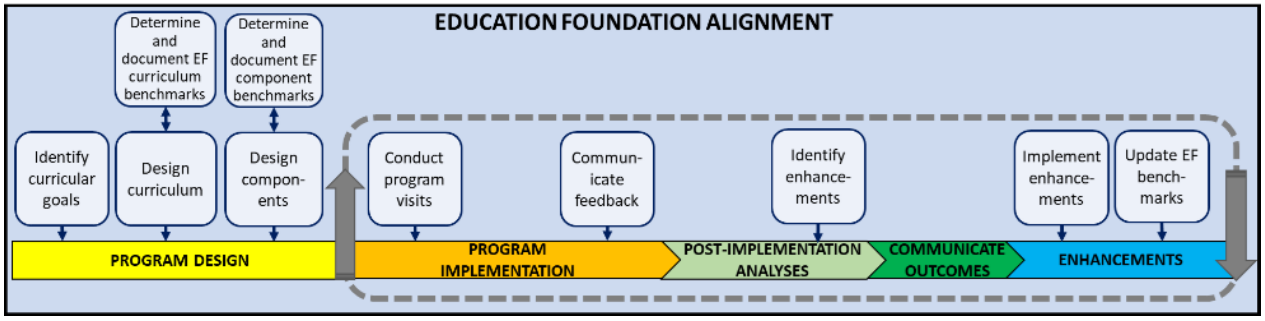


Figure 3. The Education Foundation Alignment Cycle. The Education Foundation alignment is forward-facing and backward-facing. Curricula and related components are designed to specifically address the fundamental organizational philosophies and programmatic design principles outlined in the Education Foundation. Program visits are conducted periodically to assess the curriculum and its instruction and to provide constructive feedback. This feedback is used to guide programmatic enhancements and the Education Foundation benchmarks for the program are updated, as necessary.

Methods

- One program observation for Education Foundation Alignment was conducted in December 2022.
- The observation was for the Out-of-School Program After-School camp.

Results

- The program was determined to be in overall alignment with the Education Foundation. Minor enhancements were identified, discussed, and implemented following the observation.

Qualitative: Stakeholder Feedback

Introduction

Feedback from program stakeholders is a valuable data source that informs the effectiveness of our programming. Currently, we define two types of stakeholders:

1) Teachers: partner K-12th grade teachers within our school-shed who opt-in to participate in In-School Programs.
2) Families: parents or other family members of students who participate in Out-of-School Programs.

Methods

- Teachers:
    - Teacher surveys were offered to every teacher participating in the In-School Program. Typically, surveys were offered when classes visited the Living Lab.
    - Surveys were administered via a Google Form accessed on a tablet.
    - Survey questions included:
        1. Please describe one or more aspects of this year's program that you believe were positive for your students' experience.
        2. Please describe one or more aspects of this year's program that you think could be improved.

3. Our primary goal for this program is that your students will BELIEVE that science is something they can do and a scientist is someone they can be. In your opinion, how successful was the program in meeting this goal?
4. Do you have any additional comments or feedback you would like to share?

- Families:
  - Family surveys were offered on the 5th and final day of After-School and Summer Camp.
  - Surveys were administered via paper copies.
  - Survey questions included:
    1. How happy are you with your child's experience in the ODI program? (1-5)
    2. Does your child feel better about science after completing this program? (1-5)
    3. Can you share one example of how this program has helped your child?
    4. Do you have any suggestions to improve the program?
    5. What is one thing ODI could do to help your child do better in school?

Results

Teachers

- 121 teachers completed a survey.
- Survey responses were read and trends were pulled out and grouped for each question, both within and across grade levels.
- Detailed responses by grade level were provided to the In-School Program Manager. A summary of trends by question is as follows:
  1. Please describe one or more aspects of this year's program that you believe were positive for your students' experience.
     - *Students having the opportunity to learn outside of City Heights in coastal environments.*
     - *Instructors were well-prepared, knowledgeable, engaging, patient.*
     - *Hands-on experiences with experiments, live animals, laboratory equipment.*
     - *Instructors and science leaders who are representative of student backgrounds.*
     - *Bilingual instructors.*
  2. Please describe one or more aspects of this year's program that you think could be improved.
     - *Less time "lecturing" or presenting to students and more time for activities.*
     - *Having a slower pace to field trips—some felt rushed.*
     - *Not enough program days.*
  3. Our primary goal for this program is that your students will BELIEVE that science is something they can do and a scientist is someone they can be. In your opinion, how successful was the program in meeting this goal?
     - *Very successful, both the instructors and the science leaders on Zoom were representative role models for students.*

Families

- 41 parents completed a survey.
- Survey responses were read and trends were pulled out and grouped for each question.
- Detailed responses were provided to the Out-of-School Program Manager.
- A summary of results and trends by question is as follows:
  1. How happy are you with your child's experience in the ODI program? (1-5)

    - Average response: 5 out of 5
2. Does your child feel better about science after completing this program? (1-5)
    - Average response: 4.9 out of 5
3. Can you share one example of how this program has helped your child?
    - *They have learned more about science.*
    - *They have made new friends.*
    - *They come home excited and talk more about their day.*
4. Do you have any suggestions to improve the program?
    - *Have the program be offered for longer / more days.*
    - *Take students on field trips.*
5. What is one thing ODI could do to help your child do better in school?
    - *Time for tutoring and time to do homework.*
    - *Link the curriculum to what kids are learning at school.*

Discussion

- **Communication Points:**
    - **Teachers expressed universally high satisfaction with the program in 2022-23.**
    - **Positive feedback from teachers mentioned hands-on activities, opportunities for kids to learn outside in nature, and meeting science role models who are representative of student backgrounds.**
    - **Families expressed unanimously high satisfaction with the program in 2022-23—literally every parent gave a score of 5 out of 5 in response to how happy they were with their child's program experience.**
    - **Positive feedback from families mentioned how much their kids have learned about science and marine life, and how excited they are to attend the program. Families feel the program is helping their kids in school as well as to help make new friendships.**
    - **Highlighted teacher quotes include:**
        - ***Really enjoyed the whole experience! It is so good to have your program in a neighborhood such as ours, where the families might not have the means or knowledge of a program such as this.***
        - ***I just want to thank you for the all the effort and patience throughout the day. My class was really excited about both field trips. Thank you!***
        - ***All of the teachers were encouraging and supportive. Their use of teacher moves and management strategies were excellent and made the day engaging and successful for all.***
        - ***I love this program and your beautiful facility!***
        - ***Thank you for leading our students toward being better citizens and leaders.***
        - ***We love this program! I felt like all the instructors who worked with my students were knowledgeable, thoughtful, and did a great job with classroom management! Thank you!***
        - ***Thank you for offering this program. I wish we had more days with Ocean Discovery.***
        - ***So successful! Your program definitely allows students to feel like a scientist and that is something they can be now and in the future.***
        - ***The visit by the scientist connected science to a person. The experiments got the kids thinking about their own ability.***

- ***Again, I think that meeting scientists and science teachers who they can relate to and have things in common with is a great way to meet this goal. Many of my students have expressed an interest in becoming scientists.***
- ***Many students have shown interest in the sciences. I think the program not only highlighted science as an option for a career but also provided leaders from diverse backgrounds that allowed the students to see themselves as scientists.***
- ***Some of my students said they want to work for Ocean Discovery.***
- ***I think the students can see themselves as scientists after learning about the different types of science. I also liked learning about all the ODI staff backgrounds.***
- ***Being able to ask a real live scientist questions was awesome!***
- ***The program definitely plants a seed in their little minds. It's especially important for students to have the ODI experiences year after year while in the Hoover cluster. It's neat that many of your employees came from the City Heights area.***

- **Highlighted parent quotes include:**
  - ***They play less with video games because they talk about Ocean Discovery.***
  - ***They're learning more about science and are very happy to go to this program. They want to learn more about animals and the ocean. Always talking about what they did in class.***
  - ***It helps her to socialize and she learns about the ocean life. She comes home talking about what she saw during her day.***
  - ***They have learned about animals and plants and how to do good things for our planet. They learn to be more aware of how they treat our planet.***
  - ***They are learning more about ocean animals. They always talk to me about what they do and learn. They all love going to Ocean Discovery.***
  - ***The program is a lot of help because he knows that if he does well in school he will be able to go to the next camp.***

- In the future, we will implement a third stakeholder survey to obtain feedback from students participating in Leadership Programs.

Qualitative: Alignment With Educator Principles

This evaluation mechanism is currently under development and is expected to begin during the 2024-25 school year.

DISSEMINATION

We incorporate data and key takeaways into a variety of other dissemination materials. Our organizational Annual Report discusses our achievements and is distributed broadly through our networks. We also share outcomes on our website, to funders, and to all partners who provide support for our programs and students.